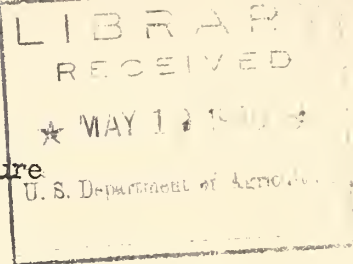


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Bureau of Biological Survey
Washington, D. C.



SUGGESTIONS FOR BEGINNERS IN RABBIT RAISING

By Frank G. Ashbrook and John W. Meyer
Division of Fur Resources

Raising domestic rabbits has proved to be an agreeable and profitable business and is becoming an important minor agricultural industry in the United States, although many persons are not yet familiar with the real worth of these animals. It is no longer a pet-stock proposition, and in some parts of the country, especially in California, is assuming large proportions. Thousands of rabbitries have been established, both on large farms specializing in rabbits and in cities. The small rabbitry actually has a place in human economy, since it can reduce the family meat bill and teach children the principles of animal husbandry during leisure hours. The future of the rabbit business, however, depends mainly upon its producing food and fur in commercial quantities.

Possibilities:

Rabbit raising is not only conducted as a side line to general farming but also offers inducements to those who can not make it a large-scale activity. In suburbs of many cities it has become a lucrative undertaking. The animals multiply rapidly, and the business of propagating them requires less labor, equipment, and capital than that of raising most other farm stock. Rabbits produce nutritious, palatable meat cheaply and a marketable fur. The manure has a high fertilizer value also, and should find a ready sale to truck farmers and fruit growers in the vicinity. In the trucking and mixed farming sections of the United States, rabbits are fed various unmarketable products.

How to Make a Start:

Persons unfamiliar with rabbit raising should not begin on an extensive scale, especially in communities in which people are not accustomed to eating rabbit meat. Those who have not made sure of a market for their product and who have started in the business on too large a scale or have expanded too rapidly have failed. It is much better to begin by raising a few rabbits and to develop a market gradually. Production can be increased easily as the demand and experience justify.

It is wise for the beginner to guard against hasty investments in rabbits. Hood profits may be obtained from the sale of breeding animals for some time to come, but the novice should realize that the more or less exceptional prices are received by experienced breeders. Even though the sale of

breeding animals will net the owner far more than marketing them for consumption, a beginner should never lose sight of the fact that rabbits are raised primarily for food and fur. The beginner who hopes to obtain an adequate return on his investment over a period of years should carefully consider the economic side of the problem before he enters the industry. The business is a promising one, yet there are problems to be solved before the beginner can feel assured that success in rabbit raising is as dependable as it is in other branches of animal husbandry. Success is largely dependent on quality, quantity, and economy of production and on efficient marketing.

Qualifications of a Rabbit Breeder:

The readiness with which rabbits breed and produce and develop young depends largely upon the attitude of the breeder toward them. Good management and interest in the welfare of the animals will lead to success. A good rabbit breeder will give them clean feed at regular intervals and supply fresh water every day. He will also see that the hutches and nest boxes are kept clean and will spend much of his time in looking after the comfort of the animals.

No breeder can expect to make much profit until he has developed a market for his output. He can demonstrate the good qualities of rabbit meat in many ways, but organized effort is more satisfactory and economical in bringing this about. Breeders should advertise to the public the delicacy of rabbit meat, and supplement this with information on the methods followed in breeding and raising as well as in marketing the meat and fur. All this is necessary to establish rabbit raising as a flourishing industry.

Where to Obtain Breeding Stock:

The success or failure of a rabbit breeder depends largely upon his ability to place the proper weight on the various points that must be considered in selecting foundation stock. This ability can be gained only through careful, systematic study, coupled with a great deal of practice in judging and handling rabbits.

National, State, and local rabbit breeders' organizations can furnish names and addresses of breeders from whom stock can be purchased. The American Rabbit and Cavy Breeders' Association, 7408 Normal Avenue, Chicago, Ill., and the National Rabbit Federation, Webster, N. Y., are prepared to furnish lists of the names and addresses of breeders.

Principles of Feeding:

To produce good meat and fur is the ambition of every rabbit breeder. The real problem in feeding rabbits is to supply them the necessary nutritive material for building and repairing the body and for furnishing sufficient energy to produce meat and fur. The most satisfactory feeds must be composed of ingredients that are wholesome, relished by the rabbits, and at the same time available at a reasonable cost.

proper feed is an important factor in keeping rabbits healthy, and thereby lessening the chances of loss from diseases. The same feeds or combinations of feeds should be used steadily, and sudden changes either in the diet or in the manner of feeding should be avoided. Though this does not mean that the same kinds of feed should be given during every season of the year, the danger is pointed out that rabbits may be "thrown off their feed" by such radical changes as occur when one breeder suddenly adopts a new ration on learning of another's success with it.

Kinds of Feed:

Rabbits have been fed all kinds of grains and mashes, various hays, and green stuff, ranging in variety from tubers to raw clippings. There is such an array of seemingly contradictory statements regarding rabbit feeds and feeding that to name and describe the value of each feed would only complicate matters and tend to confuse those who are eager to learn practical methods of feeding.

The principal concentrates fed to rabbits are barley and oats (rolled or ground), cracked corn, linseed meal, and soybean meal. Clover and timothy hay also are fed, but they are not so satisfactory as alfalfa hay. High-quality alfalfa hay is the most important part of the rabbit ration. Feeds should be reasonably soft and crumbly, but never hard or in the form of powder. Crushed and rolled barley and oats have these qualities, and rabbits prefer them to other grains.

Grain mixtures are preferable to a single grain and give good results when they contain sufficient protein. Moist mashes give better results than dry grain mixtures as a supplement to hay, and offer a wider variety of feedstuffs that may be used, such as tapioca meal, corn meal, and other finely ground feeds, and dried skim milk. Mashes should be just moist enough to hold together, but not wet enough to be soggy or sticky.

An excellent mash and one that is fairly simple to prepare is made of whole oats and coarse red bran, equal parts by weight. The whole oats are soaked in water over night or from one feeding to the next. The water is drained off, and dry bran is thoroughly mixed with the soaked oats. The resultant dry, crumbly mash is very palatable to rabbits. It is a common practice among rabbits breeders to feed this mash in the morning and hay at night, and to give such does as are raising litters an additional feed of dry rolled barley or rolled oats at night along with the hay. When an abundance of green feed is used, however, dry feeding is to be preferred.

The best mash is a combination of feeds that produces the desired results at the lowest possible cost. The following mixtures have been found to give good results:

(1)

100 lbs. feed oats (rolled)
100 lbs. barley (rolled)
35 lbs. cracked or whole wheat
35 lbs. yellow cracked corn
10 lbs. linseed meal

(2)

100 lbs. wheat bran (red)
33 lbs. barley (rolled)
33 lbs. cracked corn
4 lbs. peanut-oil meal

(3)

100 lbs. oatmeal
50 lbs. wheat bran (red)
50 lbs. whole wheat
30 lbs. cracked corn
8 lbs. linseed meal

(4)

100 lbs. feed oats (rolled)
75 lbs. wheat bran (red)
25 lbs. whole wheat
25 lbs. cracked corn
25 lbs. blackstrap molasses

Quantity and Frequency of Feeding:

Most breeders give too much feed to their rabbits. Giving a limited quantity of grain and hay at each feeding is more satisfactory than permitting rabbits access to feed at all times. This applies particularly to hay, for rabbits waste it and lose their desire for it when it is constantly before them.

High-quality alfalfa hay and rolled barley or the equivalent in a good rabbit mash make a satisfactory daily food. Rabbits eat more at night than during the day, and therefore it is advisable to feed more at night. A good method to follow is to feed grain in the morning and hay at night. This system is satisfactory for growing young stock, resting does, and bucks, but nursing does do better on two feedings of grain each day. If a mash and grain are fed it is desirable to give the mash in the morning and the grain in the evening. Green feed, such as carrots, green alfalfa, wild oats, and green barley, add to the palatability of the daily ration.

Much of the waste in feed is due to overfeeding of alfalfa hay. This may be reduced by chopping or cutting it into 3- or 4-inch lengths before feeding it, as it is consumed more readily in this form. The ration for each animal depends entirely on the season and on its age, appetite, and condition. In summer, feeding of grain should be lighter than in fall and winter. Adult rabbits should be fed fairly heavily just before and during the breeding season, so that they will be in good vigorous condition. Does suckling young and rabbits that have been weaned should be fed liberally. The appetite is a good index to feeding, and the quantity of feed supplied should be regulated so that the rabbit may remain active and show eagerness to eat at meal time.

The beginner will do well to follow some rule in determining the quantity of feed to give the rabbits, instead of guessing or estimating it. Rations for rabbits at various stages of development are presented below to serve as a guide and not as a hard-and-fast rule to be applied without the exercise of judgment. A general rule followed by rabbit breeders who have studied carefully the principles of feeding is to supply dry matter

(both hay and grain) at the rate of $\frac{1}{2}$ to $\frac{3}{4}$ ounce for each pound of live-weight as the daily requirements of the breeding doe.

Junior and senior bucks and does before kindling should receive $\frac{1}{2}$ ounce of grain once daily, with 3 ounces of alfalfa hay twice daily.

During the first 4 weeks after kindling, does and litters should receive $\frac{1}{2}$ ounce of grain and 3 ounces of alfalfa hay twice daily. When the young start eating, increase both grain and hay steadily every 4 days until they are 5 weeks of age, then feed 4 ounces of grain and 15 ounces of alfalfa hay twice daily until 8 weeks of age, when the litter is sold for meat or retained for breeding.

Following a system not only enables the rabbit breeder to feed properly and economically but helps to determine the quantities of feed required for a given number of rabbits for 6 months or a longer period. In making such estimates it is a common practice to allow nearly $1\frac{1}{2}$ pounds of alfalfa hay for each pound of grain. This is an estimate based on a large supply and is not to be considered the proportion for the daily ration.

Experimental Feeding:

Experiments conducted by the Biological Survey at the U. S. Rabbit Experiment Station, at Fontana, Calif., to determine the relation between protein and carbohydrate requirements of breeding does, indicate that the best results are obtained from rations containing high percentages of protein. Oats as a single grain are more satisfactory than barley. Grain mixtures containing wheat products have on the whole given better results in maintaining vigor and condition than mixtures from which these products are omitted.

The percentage of healthy, vigorous rabbits was increased by raising the young from weaning to breeding age in developing pens rather than in hutches. Animals raised in this manner were as a whole better developed, showed greater vitality, and were better producers than those raised in hutches. This method of developing young also materially reduces the labor of feeding and care generally.

Practical Feeding Suggestions:

The following feeding practice has proved satisfactory under average conditions for the profitable production of both meat and fur:

A basic grain ration in the form of a damp mash will serve the entire rabbitry as the morning meal, and the night meal should consist of cut alfalfa hay. The grain mash should as a rule consist largely of oats and coarse red bran, with other such grains added from time to time as may be required to meet changes in weather and in the general condition and health of the animals, and to equalize price fluctuations. In some sections it

may be advisable to use a combination of barley and red bran as the basic ingredients of the mash. It will then be well to increase the protein content of the mash. When oats and bran are used as the principal ingredients, the proper consistency of the damp mash may be had merely by soaking whole oats in water for a period of 6 to 10 hours before feeding. At feeding time the surplus water is drained off and the bran and other ingredients are added. Thorough mixing should result in a dry-crumbly mash with the smaller particles adhering to the oats. When rolled barley is the basis of the mash, it is usually found most satisfactory to have the complete mixture prepared in advance, and at feeding time to measure out such quantity as will be required. Scalding hot water should then be poured on this and the mash thoroughly mixed until all fine particles adhere to the larger grains and the whole is of a crumbly consistency. It should never be soggy and wet.

In addition to the basic grain mash and the cut alfalfa hay, it is advisable to feed does nursing large litters, or does whose litters are out of the nest box and eating grain and hay, an additional quantity of good dry grain mixture at night along with the hay. For this purpose a mixture containing any of the following grains is good: Rolled oats, rolled barley, oatmeal, cracked corn, cracked or whole wheat, and kafir corn.

The quantity of feed supplied depends on the condition of the animal, the stage of production (that is, whether it is a bred doe or a nursing doe), and the appetite of the individual. As a rule, such quantities should be fed as are readily cleaned up by the animals within a reasonably short time, allowance being made for such animals as are naturally slow eaters.

From one to two ounces of grain and from 3 to 6 ounces of hay are usually required by breeding does of the utility breeds. Does nursing litters may require several times these quantities, whereas bucks as a rule will do well on a fourth to a third less.

Whenever possible, some green feed should be included in the daily ration, even if only a small quantity. If it is not possible to feed green stuffs daily, do it as often as the animals can be fed them regularly.

Definite information is not yet available concerning the mineral requirements of rabbits, but unquestionably less chance of mineral deficiency will result when a great variety of grains and green feeds is used.

In feeding, the period of the year should be considered and close attention paid to weather conditions. Cooling, laxative feeds should be used as much as possible during the hot summer months, whereas corn, barley, and oil meals can be used to advantage in the winter months.

Management:

Successful rabbit raising requires good management in the organization of the rabbitry, selection of the breeding stock, feeding, and breeding, combined with an intimate knowledge of the characteristics and behavior of

rabbits. Improvement in breeding operations should be based on information concerning the market requirements for both meat and fur, and the producer must be acquainted with these at all times. He should make every effort to keep informed on progress in rabbit raising and should conduct or direct the affairs of his business efficiently. To be successful in rabbit raising one must be a good manager. It is just as necessary to make prudent and economical use of one's means as it is in any other industry.

Prospective Investors:

Big returns are frequently predicted or promised to prospective investors. Heavy risks, however, usually accompany such lures. Too often they are the chief talking points of financial charlatans. Promoters know that the names and endorsements of successful men carry weight and often use these without authorization. An example is the mere statement, without qualification, that the United States Department of Agriculture endorses rabbit raising, or that certain individuals or companies are engaged in raising rabbits. The prudent investor, however, will look beyond names and endorsements and investigate the merits of all propositions or contemplated transactions.

The promoter who tries to impress the prospective investor by tabulating the fabulous returns supposed to have been realized in raising rabbits unwittingly admits that his offering can not stand on its own feet. Such figures fire the imagination but they are generally deceptive. They are not a true index to the profits to be expected from any new enterprise in which a small investor is urged to put his money.

Irresponsible sellers of rabbits often "guarantee" that certain profits will be made or dividends paid, or even that they will buy back or resell when the purchaser wants his money. Such guarantees can afford protection only when their makers have financial backing. Promises of this nature are made to establish confidence and lull suspicion. They should indicate to the prospective purchaser a special need to investigate not only the securities offered but also the responsibility of the proposed guarantor.

Publications on Rabbits:

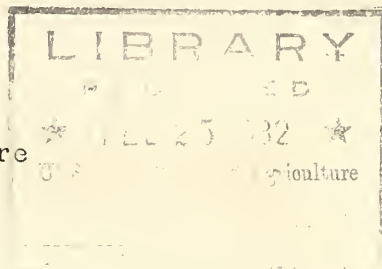
Any of the following publications may be had free, as long as the supply lasts, on a request addressed to the United States Department of Agriculture, Washington, D. C.:

Raising Domestic Rabbits (Leaflet 4-L).
Rabbit House Construction (Leaflet 15-L).
Chinchilla Rabbits for Food and Fur (Leaflet 22-L).
Rabbit Skins for Fur (Farmers' Bulletin 1519-F).
Rabbit Parasites and Diseases (Farmers' Bulletin 1568-F).

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United States Department of Agriculture
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Persons unfamiliar with rabbit raising should not begin on an extensive scale, especially in communities in which people are not accustomed to eating rabbit meat. Those who have not made sure of a market for their product and who have started in the business on too large a scale or have expanded too rapidly have failed. It is much better to begin by raising a few rabbits and to develop a market gradually. Production can be increased easily as the demand and experience justify.

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The readiness with which rabbits breed and produce and develop young depends largely upon the attitude of the breeder toward them. Good management and interest in the welfare of the animals will lead to success. A good rabbit breeder will give them clean feed at regular intervals and supply fresh water every day. He will also see that the hutches and nest boxes are kept clean and will spend much of his time in looking after the comfort of the animals.

No breeder can expect to make much profit until he has developed a market for his output. He can demonstrate the good qualities of rabbit meat in many ways, but organized effort is more satisfactory and economical in bringing this about. Breeders should advertise to the public the delicacy of rabbit meat, and supplement this with information on the methods followed in breeding and raising as well as in marketing the meat and fur. All this is necessary to establish rabbit raising as a flourishing industry.

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The success or failure of a rabbit breeder depends largely upon his ability to place the proper weight on the various points that must be considered in selecting foundation stock. This ability can be gained only through careful, systematic study, coupled with a great deal of practice in judging and handling rabbits.

National, State, and local rabbit breeders' organizations can furnish names and addresses of breeders from whom stock can be purchased. The American Rabbit and Cavy Breeders' Association, 7408 Normal Avenue, Chicago, Ill., and the National Rabbit Federation, 94 Melrose St., Buffalo, N. Y., are prepared to furnish lists of the names and addresses of breeders.

Principles of Feeding:

To produce good meat and fur is the ambition of every rabbit breeder. The real problem in feeding rabbits is to supply them the necessary nutritive material for building and repairing the body and for furnishing sufficient energy to produce meat and fur. The most satisfactory feeds must be composed of ingredients that are wholesome, relished by the rabbits, and at the same time available at a reasonable cost.

Proper feed is an important factor in keeping rabbits healthy, and thereby lessening the chances of loss from diseases. The same feeds or combinations of feeds should be used steadily, and sudden changes either in the diet or in the manner of feeding should be avoided. Though this does not mean that the same kinds of feed should be given during every season of the year, the danger is pointed out that rabbits may be "thrown off their feed" by such radical changes as occur when one breeder suddenly adopts a new ration on learning of another's success with it.

Kinds of Feed:

Rabbits have been fed all kinds of grains and mashes, various hays, and green stuff, ranging in variety from tubers to raw clippings. There is such an array of seemingly contradictory statements regarding rabbit feeds and feeding that to name and describe the value of each feed would only complicate matters and tend to confuse those who are eager to learn practical methods of feeding.

The principal concentrates fed to rabbits are barley and oats (rolled or ground), cracked corn, linseed meal, and soybean meal. Clover and timothy hay also are fed, but they are not so satisfactory as alfalfa hay. High-quality alfalfa hay is the most important part of the rabbit ration. Feeds should be reasonably soft and crumbly, but never hard or in the form of powder. Crushed and rolled barley and oats have these qualities, and rabbits prefer them to other grains.

Grain mixtures are preferable to a single grain and give good results when they contain sufficient protein. Moist mashes give better results than dry grain mixtures as a supplement to hay, and offer a wider variety of feedstuffs that may be used, such as tapioca meal, corn meal, and other finely ground feeds, and dried skim milk. Mashes should be just moist enough to hold together, but not wet enough to be soggy or sticky.

An excellent mash and one that is fairly simple to prepare is made of whole oats and coarse red bran, equal parts by weight. The whole oats are soaked in water over night or from one feeding to the next. The water is drained off, and dry bran is thoroughly mixed with the soaked oats. The resultant dry, crumbly mash is very palatable to rabbits. It is a common practice among rabbit breeders to feed this mash in the morning and hay at night, and to give such does as are raising litters an additional feed of dry rolled barley or rolled oats at night along with the hay. When an abundance of green feed is used, however, dry feeding is to be preferred.

The best mash is a combination of feeds that produces the desired results at the lowest possible cost. The following mixtures have been found to give good results:

100 lbs. feed oats (rolled)
 100 lbs. barley (rolled)
 35 lbs. cracked or whole wheat
 35 lbs. yellow cracked corn
 10 lbs. linseed meal

(2)

100 lbs. oatmeal
 50 lbs. wheat bran (red)
 50 lbs. whole wheat
 30 lbs. cracked corn
 8 lbs. linseed meal

(4)

100 lbs. wheat bran (red)
 33 lbs. barley (rolled)
 33 lbs. cracked corn
 4 lbs. peanut-oil meal

100 lbs. feed oats (rolled)
 75 lbs. wheat bran (red)
 25 lbs. whole wheat
 25 lbs. cracked corn
 25 lbs. blackstrap molasses

Quantity and Frequency of Feeding:

Most breeders give too much feed to their rabbits. Giving a limited quantity of grain and hay at each feeding is more satisfactory than permitting rabbits access to feed at all times. This applies particularly to hay, for rabbits waste it and lose their desire for it when it is constantly before them.

High-quality alfalfa hay and rolled barley or the equivalent in a good rabbit mash make a satisfactory daily food. Rabbits eat more at night than during the day, and therefore it is advisable to feed more at night. This system is satisfactory for growing young stock, resting does, and bucks, but nursing does do better on two feedings of grain each day. If a mash and grain are fed it is desirable to give the mash in the morning and the grain in the evening. Green feed, such as carrots, green alfalfa, wild oats, and green barley, add to the palatability of the daily ration.

Much of the waste in feed is due to overfeeding of alfalfa hay. This may be reduced by chopping or cutting it into 3- or 4-inch lengths before feeding it, as it is consumed more readily in this form. The ration for each animal depends entirely on the season and on its age, appetite, and condition. In summer, feeding of grain should be lighter than in fall and winter. Adult rabbits should be fed fairly heavily just before and during the breeding season, so that they will be in good vigorous condition. Does suckling young and rabbits that have been weaned should be fed liberally. The appetite is a good index to feeding, and the quantity of feed supplied should be regulated so that the rabbit may remain active and show eagerness to eat at meal time.

The beginner will do well to follow some rule in determining the quantity of feed to give the rabbits, instead of guessing or estimating it. Rations for rabbits at various states of development are presented below to serve as a guide and not as a hard-and-fast rule to be applied without the exercise of judgment. A general rule followed by rabbit breeders who have studied carefully the principles of feeding is to supply dry matter

(both hay and grain) at the rate of 1/2 to 3/4 ounce for each pound of live weight as the daily requirements of the breeding doe.

Junior and senior bucks and does before kindling should receive 1/2 ounce of grain once daily, with 3 ounces of alfalfa hay twice daily.

During the first 4 weeks after kindling, does and litters should receive 1/2 ounce of grain and 3 ounces of alfalfa hay twice daily. When the young start eating, increase both grain and hay steadily every 4 days until they are 5 weeks of age, then feed 4 ounces of grain and 15 ounces of alfalfa hay twice daily until 8 weeks of age, when the litter is sold for meat or retained for breeding.

Following a system not only enables the rabbit breeder to feed properly and economically but helps to determine the quantities of feed required for a given number of rabbits for 6 months or a longer period. In making such estimates it is a common practice to allow nearly 1-1/2 pounds of alfalfa hay for each pound of grain. This is an estimate based on a large supply and is not to be considered the proportion for the daily ration.

Experimental Feeding:

Experiments conducted by the Biological Survey at the U. S. Rabbit Experiment Station, at Fontana, Calif., to determine the relation between protein and carbohydrate requirements of breeding does, indicate that the best results are obtained from rations containing high percentages of protein. Oats as a single grain are more satisfactory than barley. Grain mixtures containing wheat products have on the whole given better results in maintaining vigor and condition than mixtures from which these products are omitted.

The percentage of healthy, vigorous rabbits was increased by raising the young from weaning to breeding age in developing pens rather than in hutches. Animals raised in this manner were as a whole better developed, showed greater vitality, and were better producers than those raised in hutches. This method of developing young also materially reduces the labor of feeding and care generally.

Practical Feeding Suggestions:

The following feeding practice has proved satisfactory under average conditions for the profitable production of both meat and fur:

A basic grain ration in the form of a damp mash will serve the entire rabbitry as the morning meal, and the night meal should consist of cut alfalfa hay. The grain mash should as a rule consist largely of oats and coarse red bran, with other such grains added from time to time as may be required to meet changes in weather and in the general condition and health of the animals, and to equalize price fluctuations. In some sections it

may be advisable to use a combination of barley and red bran as the basic ingredients of the mash. It will then be well to increase the protein content of the mash. When oats and bran are used as the principal ingredients, the proper consistency of the damp mash may be had merely by soaking whole oats in water for a period of 6 to 10 hours before feeding. At feeding time the surplus water is drained off and the bran and other ingredients are added. Thorough mixing should result in a dry-crumbly mash with the small particles adhering to the oats. When rolled barley is the basis of the mash, it is usually found most satisfactory to have the complete mixture prepared in advance, and at feeding time to measure out such quantity as will be required. Scalding hot water should then be poured on this and the mash thoroughly mixed until all fine particles adhere to the larger grains and the whole is of a crumbly consistency. It should never be soggy and wet.

In addition to the basic grain mash and the cut alfalfa hay, it is advisable to feed does nursing large litters, or does whose litters are out of the nest box and eating grain and hay, an additional quantity of good dry grain mixture at night along with the hay. For this purpose a mixture containing any of the following grains is good: Rolled oats, rolled barley, oatmeal, cracked corn, cracked or whole wheat, and kafir corn.

The quantity of feed supplied depends on the condition of the animal, the stage of production (that is, whether it is a brood doe or a nursing doe), and the appetite of the individual. As a rule, such quantities should be fed as are readily cleaned up by the animals within a reasonably short time, allowance being made for such animals as are naturally slow eaters.

From one to two ounces of grain and from 3 to 6 ounces of hay are usually required by breeding does of the utility breeds. Does nursing litters may require several times those quantities, whereas bucks as a rule will do well on a fourth to a third less.

Whenever possible, some green feed should be included in the daily ration, even if only a small quantity. If it is not possible to feed green stuffs daily, do it as often as the animals can be fed them regularly.

Definite information is not yet available concerning the mineral requirements of rabbits, but unquestionably less chance of mineral deficiency will result when a great variety of grains and green feeds is used.

In feeding, the period of the year should be considered and close attention paid to weather conditions. Cooling, laxative feeds should be used as much as possible during the hot summer months, whereas corn, barley, and oil meals can be used to advantage in the winter months.

Management:

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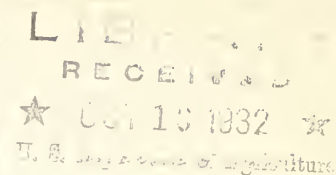
Publications on Rabbits:

Any of the following publications may be had free, as long as the supply lasts, on a request addressed to the United States Department of Agriculture, Washington, D. C.

Raising Domestic Rabbits (Leaflet 4-L).
Rabbit House Construction (Leaflet 15-L).
Chinchilla Rabbits for Food and Fur (Leaflet 22-L).
Rabbit Skins for Fur (Farmers' Bulletin 1519-F).
Rabbit Parasites and Diseases (Farmers' Bulletin 1568-F).
Rabbit Recipes (Leaflet 66-L).

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United States Department of Agriculture
Bureau of Biological Survey
Washington, D. C.



SUGGESTIONS FOR BEGINNERS IN RABBIT RAISING

By FRANK G. ASHBROOK, in charge Division of Fur Resources; and JOHN W. MEYER, director of the U. S. Rabbit Experiment Station, of the Division of Fur Resources, Fontana, Calif.

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RABBIT RAISING is developing as an important minor farm industry in many parts of the United States. A number of commercial rabbitries also have been established, both on large farms specializing in rabbits and in the suburbs of cities. The industry no longer has merely to do with pet stock, and in some parts of the country it is a business of large proportions. Its future depends mainly upon its producing rabbit meat and fur in commercial quantities.

At present relatively few established markets exist where rabbit meat is displayed and regularly offered for sale. Because of this situation, where there are no markets the meat is usually produced for home and local consumption, and the public in general is not well acquainted with the product. Once constant supplies are available, however, and the public recognizes the good qualities of rabbit meat, the demand for it will substantially increase. This fact gives promise of an encouraging future for the rabbit producer, though the business is not to be considered a venture of the "get-rich-quick" class.

Rabbit Meat as a Source of Protein:

Tests made in the Department of Agriculture show that rabbit meat compares favorably with other meats as a source of protein. These tests were made of four typical specimens of domestic rabbits of the Chinchilla, American White, and New Zealand breeds, the animals varying in age from 10 weeks to 18 months. The meat was stripped from the bones, and the heart, liver, and kidneys were removed. The

moisture and protein content were found relatively high, averaging 66 and 20 per cent, respectively; and the fat content rather low, slightly less than 12 per cent. The fuel value per pound was 1,011 calories in one experiment, 716 in another, and averaged 855 calories. The proportion of dressed weight to live weight was 51 per cent. Though this is somewhat less than that of larger meat animals, about 93 per cent of the dressed rabbit carcass is edible meat.

Rabbit Skins for Fur:

Regardless of size and color, every domestic rabbit skin has commercial value as fur, with the exception of that of the Angora, the pelt of which is not taken for fur, but the wool is sheared and used in manufacturing wearing apparel. The most important considerations as regards rabbit fur are quality and texture and the care given the pelt after removal from the carcass. A large skin is more valuable than a small one, and prices favor some colors more than others. Other things being equal, white, red, and blue skins, in the order named, are at present in greatest demand.

Pure white skins are preferable for the reason that they can be dyed light, medium, or dark shades of any color demanded by the fur trade. Red and blue skins can be dyed many of the fashionable shades or used in their natural state undyed; but grays, browns, spotted, silvers, and most others are mixed together and dyed either a black or a very dark color.

Prospective Investors:

Big returns are frequently predicted or promised to prospective investors, in spite of the heavy risks usually known to accompany such lures. Too often they are the chief talking points of financial charlatans. Promoters also know that the names and endorsements of successful men carry weight and they often use these without authorization. For example, the mere statement is made, without qualification, that the United States Department of Agriculture endorses rabbit raising, or that certain named individuals or companies are engaged in raising rabbits. Every prudent investor will look beyond names and endorsements and investigate the merits of all investment propositions.

The promoter who tries to impress the prospective investor with statements of fabulous returns supposed to have been realized in raising rabbits, unwittingly admits that his offering can not stand on its own feet. Such figures fire the imagination, but as a rule they are deceptive. They can not be considered a true index to the profits that may be expected from any new enterprise in which the small investor is urged to put his money.

Irresponsible sellers of rabbits often "guarantee" that certain profits will be made or dividends paid, or even that they will buy back or resell when the purchaser wants his money. Such guarantees can be depended upon only when their makers have financial backing. Promises of this nature, which are made to establish confidence and lull suspicion, should put the prospective purchaser on his guard. They indicate a special need to investigate not only the securities offered but also the responsibility of the guarantor.

It is unwise for the beginner to make hasty investments in rabbits. Although good profits are obtained from the sale of breeding animals, the exceptional prices are usually received only by experienced breeders. Even though the sale of breeding animals nets the owner more than marketing them as food, a beginner should never lose sight of the fact that rabbits are raised primarily for food and fur. Before he enters the industry, one who hopes to obtain an adequate return on his investment over a period of years should carefully consider the economic side of the problem. The business is a promising one, yet there are problems to be solved before one can be assured that success is as dependable as in other branches of animal husbandry. Success is largely dependent upon quality, quantity, and economy of production and upon efficient marketing.

Qualifications of a Rabbit Breeder:

The regularity with which rabbits breed and develop their young depends largely upon the attitude of the breeder toward them. Good management, proper feeding, and an interest in the welfare of his animals are essential for success. A good rabbit breeder will give his rabbits clean food at regular intervals, supply them fresh water every day, and see that the hutches and nest boxes are kept clean. The comfort of his animals will always receive first consideration.

Location of a Rabbitry:

In choosing a proper place to establish a rabbitry, one should carefully consider its nearness to market, the land values, and the availability of food and water. Extremes of temperature require special equipment. Better construction of hutches is necessary for severe winter weather, and special provision must be made for shade and cooling in hot climates. Naturally an even, mild climate would be the most satisfactory for profitable rabbit raising.

Management of a Rabbitry:

Successful rabbit raising requires good management in the organization of the rabbitry, the selection of the right kind of breeding stock, and proper attention to feeding and breeding. These practices will be benefited by an intimate knowledge of the characteristics and behavior of the rabbits. Improvement in breeding operations should be based on information concerning the market requirements for both meat and fur. The producer must be acquainted with these at all times. He should keep himself informed on the progress being made in rabbit raising and should conduct or direct the affairs of his business efficiently. It is just as necessary to make prudent and economical use of one's means in rabbit raising as in any other industry.

Labor is one of the principal factors affecting success in raising rabbits. Such operations as feeding, cleaning, handling, and marketing should all be worked out in accordance with a definite plan or program. By having a definite time for each task and performing each one in a practical manner, one person should be able to care for approximately 250 producing does, the requisite number of breeding males, and the young replacement stock. In deciding upon a work schedule, one will have to be governed by his own particular circumstances, but once his program is adopted it should be carried out regularly.

The extent of the undertaking should be governed by the labor and capital available. One who has not had previous experience in rabbit raising would do well to start with only a few animals and to expand his operations slowly in accordance with a definite plan. To start on a comparatively large scale with insufficient capital or labor usually results in failure if any unusual losses or risks are encountered. At first only a small portion of the proposed rabbitry need be completed; it is possible thus to obtain experience and knowledge of the animals without making heavy investments. Too often one encounters needlessly unattractive and poorly arranged rabbitries that have developed through lack of planning. Poor arrangement of the rabbitry increases the difficulty of maintaining sanitary conditions and of caring for the stock.

Selection of Animals:

One may start with rabbits of any age--with young rabbits just weaned, or with mature animals. With young foundation stock, one has the opportunity to become acquainted with his animals and their habits before they actually reach the production stage.

The essential requirements of good foundation stock are: (1) Health and vigor; (2) ability to reproduce profitably; and (3) type and conformation consistent with ability to produce marketable offspring of high quality. Animals deficient in vitality, even though free from disease, can not be expected to produce young profitably.

In selecting stock it is to be remembered that rabbits are raised both for meat and fur, and under ordinary circumstances the more important of these should be the production of meat. The conformation of the foundation stock should be such as will insure the production of young that will supply the local markets with fat, plump, attractive carcasses of the size desired. The rabbits best suited to the commercial production of meat and fur by virtue of size and conformation are the larger breeds, such as Flemish, New Zealand, American, Beveren, French Silver, and Chinchilla. White rabbits are more desirable because they are not only satisfactory meat producers but their fur usually brings higher prices in the large fur markets. The preference among White Flemish, New Zealand White, American White, and White Beveren breeds is largely a matter of personal choice, as meat and fur can be produced economically from any of them.

Purchasing Breeding Stock:

In purchasing breeding stock, it is better to deal directly with reliable breeders, rather than with brokers and dealers in live rabbits who are seldom in position to vouch for conditions under which their animals were produced. Reliable breeders will always stand behind the stock they offer and will gladly furnish references. National, State, and local rabbit breeders' organizations can furnish names and addresses of breeders from whom stock can be purchased.

It is contrary to the policy of the Department of Agriculture to vouch for the integrity or the financial standing of any individual or company. Inquiry regarding firms or individuals concerned with the commercial production of rabbits should be made of local chambers of commerce or better-business bureaus.

Breeding:

The age at which rabbits may be bred varies with the time required for them to attain full size. For example, in the utility breeds this is usually at 7 or 8 months; in small breeds it may be at 5 or 6 months.

The period of gestation is 31 days. Each doe should be bred four times a year, allowing 31 days for gestation and 60 days for her to raise the young, after which she is bred again. It is not advisable to keep rabbits for breeding purposes after they are 4 years old.

The number of young in a litter varies greatly. The litters may contain 10 or 12 and sometimes more. Such numbers are too large for one doe to raise, and only 7 of the best should be saved, unless the doe is an exceptionally good mother. Does vary in the quantity of milk they give, and therefore some are capable of raising larger litters than others. If several does are bred at about the same time, it is possible to adjust the number of young by transferring some from one doe to another.

Each breeding doe must have a separate hutch for herself and her young, and the buck must also be kept by himself. One buck is sufficient for 10 breeding does. At mating time the doe should be taken to the hutch of the buck. Never put the buck in the doe's hutch. When the doe is brought to the buck she should be held and quieted to prevent undue excitement. After actual copulation takes place the buck will usually fall over backward or on his side, and then the doe should be immediately removed to her own hutch. If the doe does not voluntarily accept service within four or five minutes she should be taken away and returned again the next day. A little practice will teach the operator the proper method of restraining the doe without interfering with voluntary acceptance of service. A buck and a doe should not be left together for protracted periods, as they are apt to fight and injure each other.

An accurate record should be kept of the date each doe is bred, and a few days before the young are expected, the hutch should be carefully cleaned, and the nest box, containing plenty of hay or straw, placed inside. The doe will make her own nest. A day or two after the young are born she may be removed from the hutch a few minutes in order to examine the nest, to determine the number of young in the litter, and to remove any dead ones. No other disturbance of the young is advisable until they are large enough to come out of the nest and run about the hutch. At this time the nest should be cleaned and fresh straw provided.

The young may be weaned when about 6 weeks old, but it is best to leave them with the doe until they are 8 weeks old. Males and females that are not marketed should be placed in separate hutches. A considerable number of young does may be kept together in the same open run until ready for market or breeding. The same is true of young bucks, though any that are unusually quarrelsome must be separated from the others.

Kinds of Feed:

Rabbits should be supplied the necessary nutritive material for repairing the body and producing good meat and fur. The most satisfactory feeds are those that are wholesome, relished by the rabbits, and at the same time available at a

reasonable cost. Supplying proper feed is an important factor in keeping rabbits healthy, and thereby lessening the chances of loss from disease. The same feeds or combinations of feeds should be continued without sudden changes either in the diet or in the manner of feeding. This does not mean that the same kinds of feed should be given during every season of the year. Rabbits may be "thrown off their feed," however, by such radical changes as occur when one breeder suddenly adopts a new ration on learning of another's success with it.

Rabbits have been fed all kinds of grains and mashes, various hays, and green stuff ranging in variety from tubers to lawn clippings. There are so many seemingly contradictory statements regarding rabbit feeds and feeding that to name and describe the value of each would only tend to confuse those who are eager to learn practical methods of feeding. The principal concentrates fed are barley, oats, and wheat (rolled or ground); cracked corn, kafir, linseed meal, peanut meal, and soybean meal. Other feeds often used are wheat bran, rice bran, beet pulp, and molasses. Alfalfa, clover, soybean, oats, and timothy are the principal hays fed. Of these, alfalfa and clover are used most extensively. High-quality alfalfa or other leguminous hay constitutes an important part of the rabbit ration.

Practical Feed Combinations:

From 60 to 70 per cent of the total feed may be composed of legume hay, though succulent feed, such as carrots, green alfalfa, wild oats, and green barley, adds to the palatability of the daily ration and may replace from 10 to 15 per cent of the legume hay. The remaining 40 to 30 per cent may consist of the following grain mixtures:

(1)	(3)
50 lbs. oats	45 lbs. rolled wheat
20 lbs. wheat bran	35 lbs. cracked yellow corn
25 lbs. rolled barley	10 lbs. oatmeal (rolled oats)
5 lbs. linseed meal n.p.*	10 lbs. soybean meal
(2)	(4)
45 lbs. rolled wheat	40 lbs. kafir
15 lbs. cracked yellow corn	35 lbs. rolled barley
10 lbs. dried beet pulp	15 lbs. red wheat bran
14 lbs. rolled oats	10 lbs. linseed meal o.p.**
16 lbs. linseed meal n.p.*	

* n. p., New process

**o. p., Old process

Preparation of Feed:

Grains for rabbits should be reasonably soft and crumbly, but never hard or in the form of powder. Crushed or rolled, Barley, oats, and wheat, have these qualities, and are preferred to others. Grain mixtures may be fed either dry or moist. If a moist mixture is desired, a small quantity of scalding-hot water may be added and thoroughly mixed with the grain until the fine particles adhere to the larger grains and the whole is of a crumbly consistency. The mixture should never be moistened to such an extent that it becomes soggy or sticky. The use of cold instead of scalding-hot water may cause this condition.

Another method of moistening the grain mixture is to soak whole grains, such as wheat, oats, or barley, over night or from one feeding to another. The water is then drained from the grains and the balance of the dry-grain mixture is added and thoroughly mixed with the soaked grain.

Quantity and Frequency of Feeding:

Many breeders give too much feed to their rabbits. Giving a limited quantity of grain and hay at each feeding is more satisfactory than permitting rabbits access to feed at all times. Rabbits eat more at night than during the day, and therefore it is advisable to feed the bulkier portion at night. Feeding grain in the morning and hay in the evening is satisfactory for growing young stock, resting does, and bucks. Nursing does will require additional grain in the evening.

Much of the waste in feed is due to overfeeding of alfalfa hay. This may be reduced by chopping or cutting it into 3- or 4-inch lengths before feeding, as it is consumed more readily in this form. The ration for each animal depends on the season and on its age, appetite, and condition. Grain feeding should be heavier in fall and winter than during the summer. Adult rabbits should be fed fairly heavily just before and during the breeding season, so that they may be in good vigorous condition. Does suckling young and rabbits that have been weaned should be fed liberally. The appetite is a good index to feeding, and the quantity of feed supplied should be regulated so that the rabbit may remain active and show eagerness to eat at meal time.

The beginner will do well to follow some rule in determining the quantity of feed to give his rabbits daily, instead of guessing at or estimating it. A good general rule to follow is to supply 2 1/2 to 6 ounces of hay and 1 to 2 ounces of grain daily to mature does without young, mature breeding bucks, and growing young stock of both sexes. Does that have just kindled may receive a slight increase in the grain and hay ration to supply their requirements for milk production. As the young grow and develop, further increases in the grain and hay should be made. The quantity and frequency of the increases are dependent upon the number and size of the young and the condition of the doe. The judgment of the feeder is most important in determining this.

Following a system not only enables the rabbit breeder to feed properly and economically but helps to determine the quantities of feed required for any period.

Other Feeding Suggestions:

The season should be given due consideration in feeding operations. It is well to change the plan of feeding in hot weather, because rabbits need smaller quantities in summer. Watch the animals closely and if they begin to show a disinclination to eat, reduce the quantity of feed supplied. Furthermore, give the animals their heaviest feed during the cooler periods of the day, when they are most active. During the heat of the day they show little or no interest in concentrated rations. Green feeds are then especially relished and these add freshness to the diet.

Little definite information is available concerning the mineral requirements of rabbits, but unquestionably less chance of mineral deficiency will result when the animals are supplied a wide variety of grains and green feeds.

The regular use of vitamin concentrates, such as cod-liver oil or fish-body oils, has been found beneficial. Relatively small quantities are required, usually not more than 2 per cent of the entire grain ration.

United States Rabbit Experiment Station:

In 1927, the Department of Agriculture, in cooperation with local rabbit breeders and others interested in this growing enterprise, established the United States Rabbit Experiment Station at Fontana, Calif. The chief purpose of the station is to gather reliable information on the various phases of rabbit raising, especially with regard to problems of feeding, breeding, management, and housing. This leaflet is based primarily on the experimental work that has been conducted at this station.

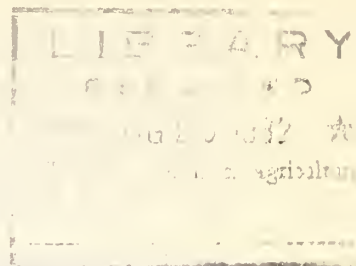
The Rabbit Experiment Station strives to meet its public obligations in assisting the rabbit breeders. The business of this station is to aid individual rabbit raisers, so that their industry may be established on a stable basis. New information obtained is being disseminated as rapidly as possible, and rabbit breeders are invited to call upon the station for information in solving their many problems and to visit the station and view the work in progress. Visiting hours are from 1 to 4 p.m., on Mondays, Wednesdays, Fridays, and Sundays, at which times some member of the station staff is on hand to supply information and answer questions.

Other Publications on Rabbits:

This material has been prepared for use in supplying information requested by correspondents. The publications listed below give additional information on certain phases of rabbit production and may be obtained by purchase, at the price per copy stated, from the Superintendent of Documents, Government Printing Office, Washington, D. C.:

Rabbit House Construction (Leaflet 15-L).....	(5 cents).
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The period of gestation is 31 days. Each doe should be bred four times a year, allowing 31 days for gestation and 60 days for her to raise the young, after which she is bred again. It is not advisable to keep rabbits for breeding purposes after they are 4 years old.

The number of young in a litter varies greatly. The litters may contain 10 or 12 and sometimes more. Such numbers are too large for one doe to raise, and only 6 of the best should be saved, unless the doe is an exceptionally good mother. Does vary in the quantity of milk they give, and therefore some are capable of raising larger litters than others. If several does are bred at about the same time, it is possible to adjust the number of young by transferring some from one doe to another.

Each breeding doe must have a separate hutch for herself and her young, and the buck must also be kept by himself. One buck is sufficient for 10 breeding does. At mating time the doe should be taken to the hutch of the buck. Never put the buck in the doe's hutch. When the doe is brought to the buck she should be held and quieted to prevent undue excitement. After actual copulation takes place the buck will usually fall over backward or on his side, and then the doe should be immediately removed to her own hutch. If the doe does not voluntarily accept service within four or five minutes she should be taken away and returned again the next day. A little practice will teach the operator the proper method of restraining the doe without interfering with voluntary acceptance of service. A buck and a doe should not be left together for protracted periods, as they are apt to fight and injure each other.

An accurate record should be kept of the date each doe is bred, and a few days before the young are expected, the hutch should be carefully cleaned, and the nest box, containing plenty of hay or straw, placed inside. The doe will make her own nest. A day or two after the young are born she may be removed from the hutch a few minutes in order to examine the nest, to determine the number of young in the litter, and to remove any dead ones. No other disturbance of the young is advisable until they are large enough to come out of the nest and run about the hutch. At this time the nest should be cleaned and fresh straw provided.

The young may be weaned when about 6 weeks old, but it is best to leave them with the doe until they are 8 weeks old. Males and females that are not marketed should be placed in separate hutches. A considerable number of young does may be kept together in the same open run until ready for market or breeding. The same is true of young bucks, though any that are unusually quarrelsome must be separated from the others.

Kinds of Feed:

Rabbits should be supplied the necessary nutritive material for repairing the body and producing good meat and fur. The most satisfactory feeds are those that are wholesome, relished by the rabbits, and at the same time available at a

reasonable cost. Supplying proper feed is an important factor in keeping rabbits healthy, and thereby lessening the chances of loss from disease. The same feeds or combinations of feeds should be continued without sudden changes either in the diet or in the manner of feeding. This does not mean that the same kinds of feed should be given during every season of the year. Rabbits may be "thrown off their feed," however, by such radical changes as occur when one breeder suddenly adopts a new ration on learning of another's success with it.

Rabbits have been fed all kinds of grains and mashes, various hays, and green stuff ranging in variety from tubers to lawn clippings. There are so many seemingly contradictory statements regarding rabbit feeds and feeding that to name and describe the value of each would only tend to confuse those who are eager to learn practical methods of feeding. The principal concentrates fed are barley, oats, and wheat (rolled or ground); cracked corn, kafir, linseed meal, peanut-cake meal, and soybean meal. Other feeds often used are wheat bran, rice bran, beet pulp, and molasses. Alfalfa, clover, soybean, oats, and timothy are the principal hays fed. Of these, alfalfa and clover are used most extensively. High-quality alfalfa or other leguminous hay constitutes an important part of the rabbit ration.

Practical Feed Combinations:

From 60 to 70 per cent of the total feed may be composed of legume hay, though succulent feed, such as carrots, green alfalfa, wild oats, and green barley, adds to the palatability of the daily ration and may replace from 10 to 15 per cent of the legume hay. The remaining 40 to 30 per cent may consist of the following grain mixtures:

(1)	(3)
50 lbs. oats	45 lbs. rolled wheat
20 lbs. wheat bran	35 lbs. cracked yellow corn
25 lbs. rolled barley	10 lbs. oatmeal (rolled oats)
5 lbs. linseed meal n.p.*	10 lbs. soybean meal
(2)	(4)
45 lbs. rolled wheat	40 lbs. kafir
15 lbs. cracked yellow corn	35 lbs. rolled barley
10 lbs. dried beet pulp	15 lbs. red wheat bran
14 lbs. rolled oats	10 lbs. linseed meal o.p.**
16 lbs. linseed meal n.p.*	

* n. p., new process

**o. p., old process

Preparation of Feed:

Grains for rabbits should be reasonably soft and crumbly, but never hard or in the form of powder. Crushed and rolled barley, oats, and wheat have these qualities, and are preferred to others. Grain mixtures may be fed either dry or moist. If a moist mixture is desired, a small quantity of scalding-hot water may be added and thoroughly mixed with the grain until the fine particles adhere to the larger grains and the whole is of a crumbly consistency. The mixture should never be moistened to such an extent that it becomes soggy or sticky. The use of cold instead of scalding-hot water may cause this condition.

Another method of moistening the grain mixture is to soak whole grains, such as wheat, oats, or barley, over night or from one feeding to another. The water is then drained from the grains and the balance of the dry-grain mixture is added and thoroughly mixed with the soaked grain.

Quantity and Frequency of Feeding:

Many breeders give too much feed to their rabbits. Giving a limited quantity of grain and hay at each feeding is more satisfactory than permitting rabbits access to feed at all times. Rabbits eat more at night than during the day, and therefore it is advisable to feed the bulkier portion at night. Feeding grain in the morning and hay in the evening is satisfactory for growing young stock, resting does, and bucks. Nursing does will require additional grain in the evening.

Much of the waste in feed is due to overfeeding of alfalfa hay. This may be reduced by chopping or cutting it into 3- or 4-inch lengths before feeding, as it is consumed more readily in this form. The ration for each animal depends on the season and on its age, appetite, and condition. Grain feeding should be heavier in fall and winter than during the summer. Adult rabbits should be fed fairly heavily just before and during the breeding season, so that they may be in good vigorous condition. Does suckling young and rabbits that have been weaned should be fed liberally. The appetite is a good index to feeding, and the quantity of feed supplied should be regulated so that the rabbit may remain active and show eagerness to eat at meal time.

The beginner will do well to follow some rule in determining the quantity of feed to give his rabbits daily, instead of guessing at or estimating it. A good general rule to follow is to supply 2 1/2 to 6 ounces of hay and 1 to 2 ounces of grain daily to mature does without young, mature breeding bucks, and growing young stock of both sexes. Does that have just kindled may receive a slight increase in the grain and hay ration to supply their requirements for milk production. As the young grow and develop, further increases in the grain and hay should be made. The quantity and frequency of the increases are dependent upon the number and size of the young and the condition of the doe. The judgment of the feeder is most important in determining this.

Following a system not only enables the rabbit breeder to feed properly and economically but helps to determine the quantities of feed required for any period.

Other Feeding Suggestions:

The season should be given due consideration in feeding operations. It is well to change the plan of feeding in hot weather, because rabbits need smaller quantities in summer. Watch the animals closely and if they begin to show a disinclination to eat, reduce the quantity of feed supplied. Furthermore, give the animals their heaviest feed during the cooler periods of the day, when they are most active. During the heat of the day they show little or no interest in concentrated rations. Green feeds are then especially relished and these add freshness to the diet.

Little definite information is available concerning the mineral requirements of rabbits, but unquestionably less chance of mineral deficiency will result when the animals are supplied a wide variety of grains and green feeds.

The regular use of vitamin concentrates, such as cod-liver oil or fish-body oils, has been found beneficial. Relatively small quantities are required, usually not more than 2 per cent of the entire grain ration.

United States Rabbit Experiment Station:

In 1927, the Department of Agriculture, in cooperation with local rabbit breeders and others interested in this growing enterprise, established the United States Rabbit Experiment Station at Fontana, Calif. The chief purpose of the station is to gather reliable information on the various phases of rabbit raising, especially with regard to problems of feeding, breeding, management, and housing. This leaflet is based primarily on the experimental work that has been conducted at this station.

The Rabbit Experiment Station strives to meet its public obligations in assisting the rabbit breeders. The business of this station is to aid individual rabbit raisers, so that their industry may be established on a stable basis. New information obtained is being disseminated as rapidly as possible, and rabbit breeders are invited to call upon the station for information in solving their many problems and to visit the station and view the work in progress. Visiting hours are from 1 to 4 p.m., on Mondays, Wednesdays, Fridays, and Sundays, at which times some member of the station staff is on hand to supply information and answer questions.

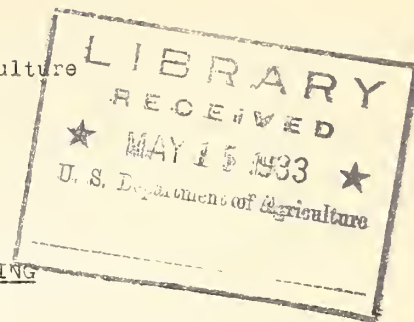
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Rabbit Skins for Fur (Farmers' Bulletin 1519-F).....	(5 cents).
Rabbit Parasites and Diseases (Farmers' Bulletin 1568-F).....	(5 cents).
Rabbit Recipes (Leaflet 66-L).....	(5 cents).

Apr. '33

United States Department of Agriculture
Bureau of Biological Survey
Washington, D. C.



SUGGESTIONS FOR BEGINNERS IN RABBIT RAISING

By FRANK G. ASHBROOK, in charge Division of Fur Resources; and
JOHN W. MEYER, director, United States Rabbit Experiment
Station, Division of Fur Resources, Fontana, Calif.

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RABBIT RAISING is becoming an important minor farm industry in many parts of the United States. A number of commercial rabbitries also have been established, both on large and small farms and in the suburbs of cities. The industry no longer has to do merely with pet stock, and in some parts of the country it is a business of large proportions. Its future depends mainly upon producing rabbit meat and fur in commercial quantities.

At present there are relatively few established markets where rabbit meat is displayed and regularly offered for sale. Consequently the meat is usually produced for home and local consumption, and the general public is not well acquainted with it. Once constant supplies are available, however, and the public recognizes the good qualities of rabbit meat, the demand for it should substantially increase. This promises an encouraging future for the rabbit producer, though the business is not in the "get-rich-quick" class.

Rabbit Meat as Food:

Rabbit meat is a good source of efficient protein and of iron. Analyses made by this Department show that it has about the same protein content as other lean meats. Of the four samples of rabbit meat analyzed, the average for protein was 20.4 percent, and for fat, 11.9 percent. The fuel value averaged 855 calories per pound. The rabbits studied were of the Chinchilla, American White, and New Zealand breeds and ranged in age from 10 weeks to 18 months.

In terms of live weight, rabbits contain about the same proportion of edible meat as do young broiling chickens, but after dressing, the waste is less than in poultry. The dressed carcasses without the edible organs averaged 51 percent of the live weight, and with them, 56 percent, the heart, liver, and kidneys averaging 5 percent. The entire edible portion, including liver, heart, and kidneys, averaged 46 percent of the live weight. The meat averaged 30 percent of the weight of the dressed carcass without the organs. The edible organs, especially the liver, should not be counted with the waste. When they are included in the purchase at the market, the edible portion constitutes about 82 percent of the purchase weight. Rabbit livers are palatable and, like the livers of other meat animals and poultry, are valuable in the diet because they help to make red blood cells.

Rabbit Skins for Fur:

Regardless of size and color, every domestic rabbit skin except that of the Angora has commercial value as fur. The pelt of the Angora is not taken for fur, but the wool is sheared and used in manufacturing wearing apparel. The most important considerations as regards rabbit fur are quality and texture and the care given the pelt after it is removed from the carcass. A large skin is more valuable than a small one, and prices favor some colors more than others. Other things being equal, white, red, and blue skins, in the order named, are at present in greatest demand.

Pure white skins are preferable because they can be dyed light, medium, or dark shades of any color demanded by the fur trade. Red and blue skins can be dyed many of the fashionable shades or used in their natural state undyed; but grays, browns, spotted, silvers, and most others are mixed together and dyed black or some other dark color.

Prospective Profits:

Unwarrantedly large returns are frequently predicted or promised to prospective investors, in spite of the heavy risks usually known to accompany such lures. Promoters also sometimes use names and endorsements without authorization. For example, the mere statement has been made, without qualification, that the United States Department of Agriculture endorses rabbit raising, or that certain named individuals or companies are engaged in raising rabbits. The promoter who tries to impress the prospective investor with statements of fabulous returns from raising rabbits, unwittingly admits that his offering cannot stand on its own feet.

Irresponsible sellers of rabbits often "guarantee" that certain profits will be made or dividends paid, or even that they will buy back or resell when the purchaser wants his money. Such guarantees can be depended upon only when their makers have financial backing. Promises of this nature, which are made to establish confidence and lull suspicion, should put the prospective purchaser on his guard. They indicate a special need to investigate not only the securities offered but also the responsibility of the guarantor.

It is unwise for the beginner to make hasty investments in rabbits. Although good profits are obtained from the sale of breeding animals, the exceptional

prices are usually received only by experienced breeders. Even though the sale of breeding animals may in some cases net the owner more than marketing the rabbits as food, a beginner should never lose sight of the fact that rabbits are raised primarily for food and fur. Before he enters the industry, one who hopes to obtain an adequate return on his investment over a period of years should carefully consider the economic side of the problem. Success is largely dependent upon quality and quantity of animals and upon the economy of production and efficient marketing.

The Rabbit Breeder:

The regularity with which rabbits breed and develop their young depends largely upon the attitude of the breeder toward them. Good management, proper feeding, and an interest in the welfare of the animals are essential for success. A good breeder will give his rabbits clean food at regular intervals, supply them fresh water every day, and see that the hutches and nest boxes are kept clean. The comfort of his animals will always receive first consideration.

Location of a Rabbitry:

The location of a rabbitry should be selected after careful consideration of its nearness to market, the land values, and the availability of food and water. Extremes of temperature require special equipment. Better construction of hutches is necessary for severe winter weather, and special provision must be made for shade and cooling in hot climates. Naturally an even, mild climate is the most satisfactory for profitable rabbit raising.

Management of a Rabbitry:

Successful rabbit raising requires good management in organizing the rabbitry, in selecting the right kind of breeding stock, and in proper feeding and breeding. These practices will be furthered by an intimate knowledge of the characteristics and behavior of the rabbits. Improvement in breeding operations should be based on information about the market requirements for both meat and fur. The producer must be acquainted with these requirements at all times, and should keep himself informed on the progress being made in rabbit raising.

Labor is one of the principal factors affecting success in raising rabbits. Such operations as feeding, cleaning, handling, and marketing should all be carried out according to a definite plan or program. By having a stated time for each task and performing each one efficiently, one person should be able to care for approximately 250 producing does, the requisite number of breeding males, and the young replacement stock.

The extent of the undertaking should be governed by the labor and capital available. A person who has not had previous experience would do well to start with only a few rabbits and to expand his operations slowly and on a definite plan. Starting on a comparatively large scale with insufficient capital or labor usually results in failure if any unusual losses or risks are encountered. Only a small portion of the proposed rabbitry need be completed at first; it is possible thus to obtain experience and knowledge of the animals without making heavy investments.

Needlessly unattractive and poorly arranged rabbitries that have been developed without planning are frequent. Poor arrangement of the rabbitry increases the difficulty of maintaining sanitary conditions and of caring for the stock.

Selection of Animals:

The rabbit raiser may start with stock of any age--young rabbits just weaned, or mature animals. Using young foundation stock gives the opportunity to become acquainted with the animals and their habits before they actually reach the production stage.

The essential requirements of good foundation stock are: (1) Health and vigor, (2) ability to reproduce profitably, and (3) type and conformation consistent with ability to produce marketable offspring of high quality. Animals deficient in vitality, even though free from disease, cannot be expected to produce young profitably.

In selecting stock it is always to be remembered that rabbits are raised for both meat and fur, and under ordinary circumstances the more important of these is meat. The conformation of the foundation stock should insure the production of young that will supply the local markets with fat, plump, attractive carcasses of the size desired. The rabbits best suited by size and conformation to the commercial production of meat and fur are the larger breeds, such as Flemish, New Zealand, American, Beveren, French Silver, and Chinchilla. White rabbits are more desirable because they are not only satisfactory meat producers but their fur usually brings higher prices in the large fur markets. The preference among White Flemish, New Zealand White, American White, and White Beveren breeds is largely a matter of personal choice, as meat and fur can be produced economically from any of them.

Purchasing Breeding Stock:

In purchasing breeding stock, it is better to deal directly with reliable breeders, rather than with brokers and dealers in live rabbits, as these persons are seldom able to vouch for conditions under which their animals were produced. Reliable breeders will always stand behind the stock they offer and will furnish references. National, State, and local rabbit breeders' organizations can furnish names and addresses of breeders from whom stock can be purchased.

It is contrary to the policy of the Department of Agriculture to vouch for the integrity or the financial standing of any individual or company. Inquiry regarding firms or individuals concerned in commercial production of rabbits should be made of local chambers of commerce or better-business bureaus.

Breeding:

The age at which the different kinds of rabbits may be bred varies with the time required to attain full size. In the utility breeds this is usually 7 or 8 months; in small breeds it may be 5 or 6 months.

The period of gestation is 31 days. Each doe should be bred four times a year, allowing 31 days for gestation and about two months to raise her young, after

which she is bred again. It is not advisable to keep rabbits for breeding purposes after they are 4 years old.

The number of young in a litter varies greatly. The litters may contain 10 or 12 and sometimes more. Such litters are too large for one doe to raise, and only 7 of the best should be saved, unless the doe is an exceptionally good mother. Does differ in the quantity of milk they give, and therefore some are capable of raising larger litters than others. If several does are bred at about the same time, it is possible to transfer some of the young from one doe to another.

Each breeding doe must have a separate hutch for herself and her young, and the buck must also be kept by himself. One buck is sufficient for 10 breeding does. At mating time the doe should be taken to the hutch of the buck. Never put the buck in the doe's hutch. When the doe is brought to the buck she should be held and quieted to prevent undue excitement. After copulation takes place the buck will usually fall over backward or on his side, and the doe should then be immediately removed to her own hutch. If the doe does not voluntarily accept service within 4 or 5 minutes, she should be taken away and returned again the next day. A little practice will teach the operator the proper method of restraining the doe without interfering with voluntary acceptance of service. A buck and a doe should not be left together for long periods, as they are likely to fight and injure each other.

An accurate record of the date on which each doe is bred should be kept. A few days before the young are expected, the hutch should be carefully cleaned, and the nest box, containing plenty of hay or straw, placed inside. The doe will make her own nest. A day or two after the young are born she may be removed from the hutch a few minutes in order to examine the nest, to determine the number of young in the litter, and to remove any dead ones. No other disturbance of the young is advisable until they are large enough to come out of the nest and run about the hutch. At this time the nest should be cleaned and fresh straw provided.

The young may be weaned when about 6 weeks old, but it is best to leave them with the doe until they are 8 weeks old. Males and females that are not marketed should be placed in separate hutches. A considerable number of young does may be kept together in the same open run until ready for market or breeding. The same is true of young bucks, though any that are unusually quarrelsome must be separated from the others.

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Practical Feed Combinations:

From 60 to 70 percent of the total feed may be composed of legume hay, though succulent feed, such as carrots, green alfalfa, wild oats, and green barley adds to the palatability of the daily ration and may replace from 10 to 15 percent of the legume hay. The remaining 40 to 30 percent may consist of one of the following grain mixtures:

(1)	(3)
50 pounds oats	45 pounds rolled wheat
20 pounds wheat bran	35 pounds cracked yellow corn
25 pounds rolled barley	10 pounds oatmeal (rolled oats)
5 pounds new process linseed meal	10 pounds soybean meal
(2)	(4)
45 pounds rolled wheat	40 pounds kafir
15 pounds cracked yellow corn	35 pounds rolled barley
10 pounds dried beet pulp	15 pounds red wheat bran
14 pounds rolled oats	10 pounds old process linseed meal
16 pounds new process linseed meal	

Preparation of Feed:

Grains for rabbits should be reasonably soft and crumbly, but never hard or powdered. Crushed or rolled barley, oats, and wheat have these qualities, and are preferred to others. Grain mixtures may be fed either dry or moist. If a moist mixture is desired, a small quantity of scalding-hot water may be added and thoroughly mixed with the grain until the fine particles adhere to the larger grains and the whole is of a crumbly consistency. The mixture should never be moistened so much that it becomes soggy or sticky. Using cold instead of scalding-hot water may bring about this condition.

Another method of moistening the grain mixture is to soak whole grains, such as wheat, oats, or barley, overnight or from one feeding to another. The water is then drained from the grains and the balance of the dry-grain mixture is added and thoroughly mixed with the soaked grain.

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Many breeders feed their rabbits too much. Giving a limited quantity of grain and hay at each feeding is more satisfactory than permitting rabbits access

to feed at all times. Rabbits eat more at night than during the day, and therefore it is advisable to feed the bulkier portion of the ration at night. Feeding grain in the morning and hay in the evening is satisfactory for growing young stock, resting does, and bucks. Nursing does require additional grain in the evening.

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The beginner will do well to follow a rule in determining the quantity of feed to give his rabbits daily, instead of guessing or estimating. A good general rule is to supply $2\frac{1}{2}$ to 6 ounces of hay and 1 to 2 ounces of grain daily to mature does without young, to mature breeding bucks, and to growing young stock of both sexes. Does that have just kindled may receive a slight increase in the grain and hay ration to supply their requirements for milk production. As the young grow and develop, further increases in the grain and hay should be made. The quantity and frequency of the increases are dependent upon the number and size of the young and the condition of the doe. The judgment of the feeder is most important in determining this.

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The regular use of vitamin concentrates, such as cod-liver oil or fish-body oils, has been found beneficial. Relatively small quantities are required, usually not more than 2 percent, by weight, of the entire grain ration.

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Prepared in the Division of Fur Resources

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Pure white skins are preferable because they can be dyed light, medium, or dark shades of any color demanded by the fur trade. Red and blue skins can be dyed many of the fashionable shades or used in their natural state undyed; but grays, browns, spotted, silvers, and most others are mixed together and dyed black or some other dark color.

Prospective Profits:

Unwarrantedly large returns are frequently predicted or promised to prospective investors, in spite of the heavy risks usually known to accompany such lures. Promoters also sometimes use names and endorsements without authorization. For example, the mere statement has been made, without qualification, that the United States Department of Agriculture endorses rabbit raising, or that certain named individuals or companies are engaged in raising rabbits. The promoter who tries to impress the prospective investor with statements of fabulous returns from raising rabbits, unwittingly admits that his offering cannot stand on its own feet.

Irresponsible sellers of rabbits often "guarantee" that certain profits will be made or dividends paid, or even that they will buy back or resell when the purchaser wants his money. Such guarantees can be depended upon only when their makers have financial backing. Promises of this nature, which are made to establish confidence and lull suspicion, should put the prospective purchaser on his guard. They indicate a special need to investigate not only the securities offered but also the responsibility of the guarantor.

It is unwise for the beginner to make hasty investments in rabbits. Although good profits are obtained from the sale of breeding animals, the exceptional

prices are usually received only by experienced breeders. Even though the sale of breeding animals may in some cases net the owner more than marketing the rabbits as food, a beginner should never lose sight of the fact that rabbits are raised primarily for food and fur. Before he enters the industry, one who hopes to obtain an adequate return on his investment over a period of years should carefully consider the economic side of the problem. Success is largely dependent upon quality and quantity of animals and upon the economy of production and efficient marketing.

The Rabbit Breeder:

The regularity with which rabbits breed and develop their young depends largely upon the attitude of the breeder toward them. Good management, proper feeding, and an interest in the welfare of the animals are essential for success. A good breeder will give his rabbits clean food at regular intervals, supply them fresh water every day, and see that the hutches and nest boxes are kept clean. The comfort of his animals will always receive first consideration.

Location of a Rabbitry:

The location of a rabbitry should be selected after careful consideration of its nearness to market, the land values, and the availability of food and water. Extremes of temperature require special equipment. Better construction of hutches is necessary for severe winter weather, and special provision must be made for shade and cooling in hot climates. Naturally an even, mild climate is the most satisfactory for profitable rabbit raising.

Management of a Rabbitry:

Successful rabbit raising requires good management in organizing the rabbitry, in selecting the right kind of breeding stock, and in proper feeding and breeding. These practices will be furthered by an intimate knowledge of the characteristics and behavior of the rabbits. Improvement in breeding operations should be based on information about the market requirements for both meat and fur. The producer must be acquainted with these requirements at all times, and should keep himself informed on the progress being made in rabbit raising.

Labor is one of the principal factors affecting success in raising rabbits. Such operations as feeding, cleaning, handling, and marketing should all be carried out according to a definite plan or program. By having a stated time for each task and performing each one efficiently, one person should be able to care for approximately 250 producing does, the requisite number of breeding males, and the young replacement stock.

The extent of the undertaking should be governed by the labor and capital available. A person who has not had previous experience would do well to start with only a few rabbits and to expand his operations slowly and on a definite plan. Starting on a comparatively large scale with insufficient capital or labor usually results in failure if any unusual losses or risks are encountered. Only a small portion of the proposed rabbitry need be completed at first; it is possible thus to obtain experience and knowledge of the animals without making heavy investments.

Needlessly unattractive and poorly arranged rabbitries that have been developed without planning are frequent. Poor arrangement of the rabbitry increases the difficulty of maintaining sanitary conditions and of caring for the stock.

Selection of Animals:

The rabbit raiser may start with stock of any age—young rabbits just weaned, or mature animals. Using young foundation stock gives the opportunity to become acquainted with the animals and their habits before they actually reach the production stage.

The essential requirements of good foundation stock are: (1) Health and vigor, (2) ability to reproduce profitably, and (3) type and conformation consistent with ability to produce marketable offspring of high quality. Animals deficient in vitality, even though free from disease, cannot be expected to produce young profitably.

In selecting stock it is always to be remembered that rabbits are raised for both meat and fur, and under ordinary circumstances the more important of these is meat. The conformation of the foundation stock should insure the production of young that will supply the local markets with fat, plump, attractive carcasses of the size desired. The rabbits best suited by size and conformation to the commercial production of meat and fur are the larger breeds, such as Flemish, New Zealand, American, Beveren, French Silver, and Chinchilla. White rabbits are more desirable because they are not only satisfactory meat producers but their fur usually brings higher prices in the large fur markets. The preference among White Flemish, New Zealand White, American White, and White Beveren breeds is largely a matter of personal choice, as meat and fur can be produced economically from any of them.

Purchasing Breeding Stock:

In purchasing breeding stock, it is better to deal directly with reliable breeders, rather than with brokers and dealers in live rabbits, as these persons are seldom able to vouch for conditions under which their animals were produced. Reliable breeders will always stand behind the stock they offer and will furnish references. National, State, and local rabbit breeders' organizations can furnish names and addresses of breeders from whom stock can be purchased.

It is contrary to the policy of the Department of Agriculture to vouch for the integrity or the financial standing of any individual or company. Inquiry regarding firms or individuals concerned in commercial production of rabbits should be made of local chambers of commerce or better-business bureaus.

Breeding:

The age at which the different kinds of rabbits may be bred varies with the time required to attain full size. In the utility breeds this is usually 7 or 8 months; in small breeds it may be 5 or 6 months.

The period of gestation is 31 days. Each doe should be bred four times a year, allowing 31 days for gestation and about two months to raise her young, after

which she is bred again. It is not advisable to keep rabbits for breeding purposes after they are 4 years old.

The number of young in a litter varies greatly. The litters may contain 10 or 12 and sometimes more. Such litters are too large for one doe to raise, and only 7 of the best should be saved, unless the doe is an exceptionally good mother. Does differ in the quantity of milk they give, and therefore some are capable of raising larger litters than others. If several does are bred at about the same time, it is possible to transfer some of the young from one doe to another.

Each breeding doe must have a separate hutch for herself and her young, and the buck must also be kept by himself. One buck is sufficient for 10 breeding does. At mating time the doe should be taken to the hutch of the buck. Never put the buck in the doe's hutch. When the doe is brought to the buck she should be held and quieted to prevent undue excitement. After copulation takes place the buck will usually fall over backward or on his side, and the doe should then be immediately removed to her own hutch. If the doe does not voluntarily accept service within 4 or 5 minutes, she should be taken away and returned again the next day. A little practice will teach the operator the proper method of restraining the doe without interfering with voluntary acceptance of service. A buck and a doe should not be left together for long periods, as they are likely to fight and injure each other.

An accurate record of the date on which each doe is bred should be kept. A few days before the young are expected, the hutch should be carefully cleaned, and the nest box, containing plenty of hay or straw, placed inside. The doe will make her own nest. A day or two after the young are born she may be removed from the hutch a few minutes in order to examine the nest, to determine the number of young in the litter, and to remove any dead ones. No other disturbance of the young is advisable until they are large enough to come out of the nest and run about the hutch. At this time the nest should be cleaned and fresh straw provided.

The young may be weaned when about 6 weeks old, but it is best to leave them with the doe until they are 8 weeks old. Males and females that are not marketed should be placed in separate hutches. A considerable number of young does may be kept together in the same open run until ready for market or breeding. The same is true of young bucks, though any that are unusually quarrelsome must be separated from the others.

Feeding:

Rabbits should be supplied the necessary nutritive material for repairing the body and producing good meat and fur. The most satisfactory feeds are those that are wholesome, relished by the rabbits, and at the same time available at a reasonable cost. Supplying proper feed is an important factor in keeping rabbits healthy and thereby lessening losses from disease. The same feeds or combinations of feeds should be continued without sudden changes either in the diet or in the manner of feeding. This does not mean that the same kinds of feed should be given during every season of the year, but rabbits may be "thrown off their feed" by such radical changes as occur when one breeder suddenly adopts a new ration on learning of another's success with it.

Rabbits have been fed all kinds of grains and mashes, various hays, and green stuff ranging from tubers to lawn clippings. There are so many seemingly contradictory statements regarding rabbit feeds and feeding that to name and describe the value of each would only confuse those who wish to learn practical methods of feeding. The principal concentrates fed are barley, oats, and wheat (rolled or ground); cracked corn, kafir, linseed meal, peanut meal, and soybean meal. Other feeds often used are wheat bran, rice bran, beet pulp, and molasses. Alfalfa, clover, soybean, oats, and timothy are the principal hays fed. Of these, alfalfa and clover are used most extensively. High-quality alfalfa or other leguminous hay constitutes an important part of the rabbit ration.

Practical Feed Combinations:

From 60 to 70 percent of the total feed may be composed of legume hay, though succulent feed, such as carrots, green alfalfa, wild oats, and green barley adds to the palatability of the daily ration and may replace from 10 to 15 percent of the legume hay. The remaining 40 to 30 percent may consist of one of the following grain mixtures:

(1)	(3)
50 pounds oats	45 pounds rolled wheat
20 pounds wheat bran	35 pounds cracked yellow corn
25 pounds rolled barley	10 pounds oatmeal (rolled oats)
5 pounds new process linseed meal	10 pounds soybean meal
(2)	(4)
45 pounds rolled wheat	40 pounds kafir
15 pounds cracked yellow corn	35 pounds rolled barley
10 pounds dried beet pulp	15 pounds red wheat bran
14 pounds rolled oats	10 pounds old process linseed meal
16 pounds new process linseed meal	

Preparation of Feed:

Grains for rabbits should be reasonably soft and crumbly, but never hard or powdered. Crushed or rolled barley, oats, and wheat have these qualities, and are preferred to others. Grain mixtures may be fed either dry or moist. If a moist mixture is desired, a small quantity of scalding-hot water may be added and thoroughly mixed with the grain until the fine particles adhere to the larger grains and the whole is of a crumbly consistency. The mixture should never be moistened so much that it becomes soggy or sticky. Using cold instead of scalding-hot water may bring about this condition.

Another method of moistening the grain mixture is to soak whole grains, such as wheat, oats, or barley, overnight or from one feeding to another. The water is then drained from the grains and the balance of the dry-grain mixture is added and thoroughly mixed with the soaked grain.

Quantity and Frequency of Feeding:

Many breeders feed their rabbits too much. Giving a limited quantity of grain and hay at each feeding is more satisfactory than permitting rabbits access

to feed at all times. Rabbits eat more at night than during the day, and therefore it is advisable to feed the bulkier portion of the ration at night. Feeding grain in the morning and hay in the evening is satisfactory for growing young stock, resting does, and bucks. Nursing does require additional grain in the evening.

Much of the waste in feed is due to overfeeding of alfalfa hay. This may be reduced by chopping or cutting the hay into 3- or 4-inch lengths before feeding, as it is consumed more readily in this form. The ration for each animal depends on its age, appetite, and condition and on the season. Grain feeding should be heavier in fall and winter than in summer. Adult rabbits should be fed fairly heavily just before and during the breeding season, so that they may be in good vigorous condition. Does that are suckling young and rabbits that have been weaned should be fed liberally. The appetite is a good index to feeding, and the quantity of feed supplied should be regulated, so that the rabbit may remain active and show eagerness to eat at meal time.

The beginner will do well to follow a rule in determining the quantity of feed to give his rabbits daily, instead of guessing or estimating. A good general rule is to supply $2\frac{1}{2}$ to 6 ounces of hay and 1 to 2 ounces of grain daily to mature does without young, to mature breeding bucks, and to growing young stock of both sexes. Does that have just kindled may receive a slight increase in the grain and hay ration to supply their requirements for milk production. As the young grow and develop, further increases in the grain and hay should be made. The quantity and frequency of the increases are dependent upon the number and size of the young and the condition of the doe. The judgment of the feeder is most important in determining this.

Following a system not only enables the rabbit breeder to feed properly and economically but also makes it possible for him to determine the quantities of feed required for any period.

Other Feeding Suggestions:

The season should be given due consideration in feeding operations. It is well to change the plan of feeding in hot weather, because rabbits need smaller quantities in summer. Watch the animals closely and if they begin to show a disinclination to eat, reduce the quantity of feed supplied. Furthermore, give them their heaviest feed during the cooler periods of the day, when they are most active. During the heat of the day they show little interest in concentrated rations. Green feeds are especially relished then and these add freshness to the diet.

Little definite information on the mineral requirements of rabbits is available, but unquestionably there will be less chance of mineral deficiency if the animals are given a wide variety of grains and green feeds.

The regular use of vitamin concentrates, such as cod-liver oil or fish-body oils, has been found beneficial. Relatively small quantities are required, usually not more than 2 percent, by weight, of the entire grain ration.

United States Rabbit Experiment Station:

In 1927, the Department of Agriculture, in cooperation with local breeders and others interested in rabbit raising, established the United States Rabbit Experiment Station at Fontana, Calif. The chief purpose of the station is to gather reliable information on the various phases of rabbit raising, especially with regard to problems of feeding, breeding, management, and housing. This leaflet is based primarily on the experimental work that has been conducted at this station. New information obtained is being disseminated as promptly as possible, and rabbit breeders are invited to call upon the station for information in solving their problems and to visit the station and view the work in progress.

Other Publications on Rabbits:

This information has been prepared for use in answering correspondents. The publications listed below give additional information on certain phases of rabbit production and may be obtained by purchase, at 5 cents per copy, from the Superintendent of Documents, Government Printing Office, Washington, D. C.:

Rabbit Parasites and Diseases (Farmers' Bulletin 1568).

Rabbit Recipes (Leaflet 66).